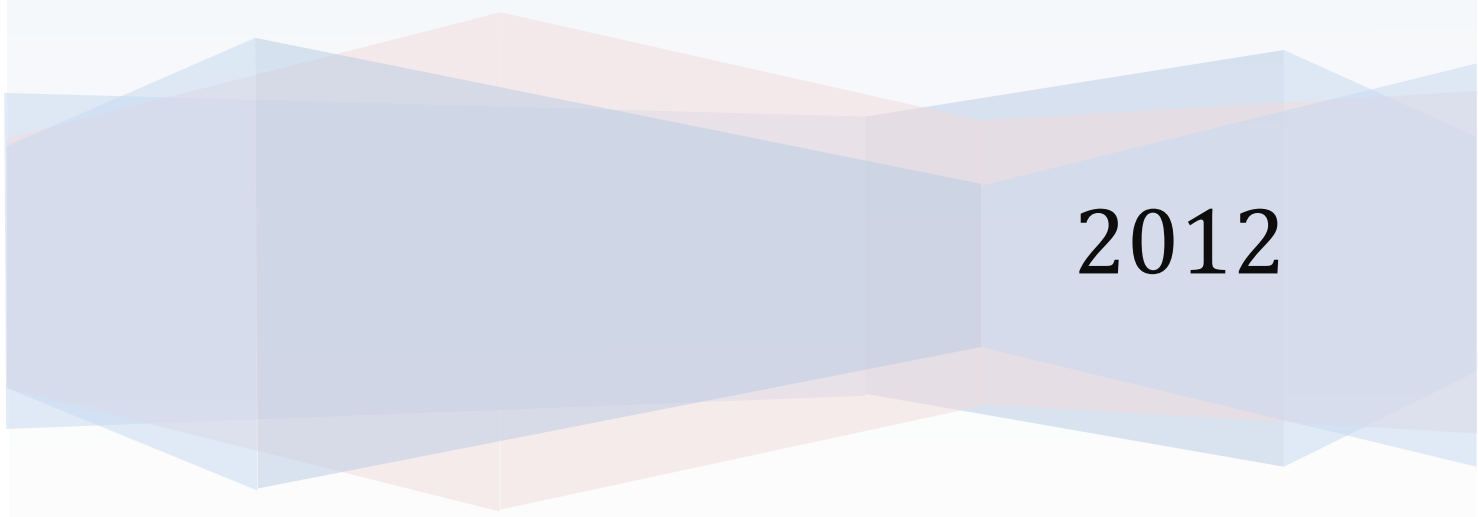


Master student projects

Center for Industrial Asset management



2012

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Title: Split location project execution

Status:

Abstract:

Denne oppgaven omhandler Split Location prosjektgjennomføring (SLP), som vil si prosjektering for ett og samme prosjekt som utføres på to eller flere lokasjoner. Aker Solutions har de siste seks årene benyttet SLP mellom flere lokasjoner for å være fleksible, samt for å øke tilgangen til ressurser. I Stavanger har det vært mest SLP mellom Stavanger og Mumbai, hvor Mumbai i tillegg har gitt Aker Solutions bedre økonomiske betingelser ved at ressurser i Mumbai er rimeligere enn norske ingeniører.

Student name: Peter Andre Skumsnes
Academic advisor: Liyanage, Jayantha
Partners: Aker Solutions
Contact information: E-mail: j.p.liyanage@uis.no

Title: Sustainability-based development of local food service in a hypermarket context A case study in inland

Status:

Abstract:

Food retailing is one of the most diverse and dynamic sectors in developed societies, offering a seemingly increasing range of food and services to consumers. Food retailers have recently started taking sustainable initiatives according to their business rationales. Local food is one of these initiatives, which means growing, producing and consuming food in the same region. The reason behind retailers' support for local food routes into the retailer market is increased customer demand and response to public criticism. The following business needs should therefore be considered when local food is examined in a large food retailer, hypermarket, context: i) the need for sustainability performance measures for local food service scenario assessment in order to meet the customer's and public's expectations, ii) the need for co-development of local food service in order to stabilize demand and supply of local food, and iii) the need for a marketing concept in order to visualize the values associated with local food. The purpose of the thesis is to introduce sustainability aspects and operationalize sustainability by involving these in the local food service development process in a hypermarket.

Student name: Eren Thalji, Nurdan
Academic advisor: Liyanage, Jayantha P.
Partners:
Contact information: E-mail: j.p.liyanage@uis.no

Title: **Troubleshooting a comple offshore system based on technical evaluation and integrity assessments - case study of module handling system**

Status:

Abstract:

The offshore industry is seeing the advent of new technologies and complex systems as it ventures into harsher and more remote locations. Integrity and reliability are the keys to such systems. It is critical to technically evaluate these complex systems thoroughly and modify them to meet the harsh challenges they have to withstand. The already existing mobile assets also have to be studied and recertified to meet the higher load conditions of rougher seas. The module handling system (MHS) is a complex system which could handle up to 60Te of subsea modules at 4. Hs making it versatile system in the North Sea subsea market. The MHS has various structural, electrical, mechanical, hydraulic, control subsystems which have to be upgraded and properly interfaced to meet the requirements. The main objective of this thesis is to evaluate the system by studying all the subsystems in detail and providing with solutions / recommendations for improving the reliability. Various areas of improvement have been identified.

Student name: Jayakumar, Shambhu
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Partners:
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Title: **Incorporating a human perspective into subsea well intervention SW decision making and work performance at SW vessels**

Status:

Abstract:

The key to maintaining well integrity, minimizing production decline and improving recovery efficiency, is to provide well services to the subsea wells (Lønnes, Williams and Burleson, 2000). The Subsea Well Intervention (SWI) industry is a specialized segment of the petroleum industry, and represents a very complex work setting in the offshore environment. The RLWI (Riserless Light Well Intervention) and A-S are two different types of SWI concepts studied in this thesis. RLWI has been used for decades, while A-S is still in the commercial phase. The RLWI vessel Island Constructor and the A-S vessel Havila Phoenix was chosen as the study basis. The SWI concepts may face challenges due to Human-Technology-Organization (HTO) factors which may cause consequences that might affect the decision making, work performance, safety and organizational goals. The purpose of this thesis is to present the methods for identifying and analyzing the challenges which may affect decision making and work performance at SWI vessels, from a human perspective.

Student name: Haraldseide, Camilla
Academic advisor: Jayantha P. Liyanage
Partners:
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Title: **The role and use of Expert systems for Offshore assets on the Norwegian continental shelf: Status quo and value creating measures**

Status:

Abstract

The ultimate goal of collaborative operating environments is value creation. All over the world, Expert Systems (ES) are being employed by various industrial sectors to foster this value creation process. Subsequently, what this project sought to do was to examine the current role and use of expert systems for value creation in the Norwegian offshore oil and gas industry through asset management, and more specifically maintenance. Through literature reviews and vendor surveys, we were able to establish that the Norwegian industry closely mimics the global O & G industry in its adoption and use of expert systems technology. This portion of the report also suggests that the lack of widespread adoption within maintenance is a contributory factor to the proliferation of preventive maintenance strategies on the Norwegian Continental Shelf.

Student name: Nii Nortey Lokko,
Academic advisor: Liyanage, Jayantha
Partners: Apply S rco
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Title: **Developing a reference model for
Benchmarking Performance Improvement in
Operations Maintenance**

Status:

Abstract

Statoil has a major responsibility of “driving simplification and improvement initiatives” by relying on tools such as benchmarking. The aim is to drive business performance based on best practice rather than on compliance. To date, the full potential of benchmarking has not been realized since the concept is not easy to define, let alone follow-up. A great deal of knowledge and practice remains hidden in the Statoil system that can be effectively used to drive performance based on effective Benchmarking. However, no major initiative to date had the objective of uncovering this information.

Student name: Riad El-Wardani
Academic advisor: Liyanage, Jayantha P.
Partners: Statoil
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Title: **Mapping work processes and Business collaboration**

Status:

Abstract

Som følge av den teknologiske utviklingen vi har i dag, gjennomgår industrien store omveltninger hvor tid og sted ikke er en begrensning. Snart kan "alt" utføres over nett, og man trenger ikke lengre være fysisk tilstede for å utføre en jobb. Den teknologiske era har også nådd petroleumsindustrien hvor utviklingen krever et høyere nivå av både samarbeid og utnyttelse av teknologien for å overleve i bransjen. Oppgaven har konkret tatt for seg driftsteamet i olje- og gassproduksjonsselskapet DONG E P Norge og deres utfordringer knyttet til samarbeidene som i dag forsvaret selskapets eksistens på norsk sektor. Generell samarbeidsteori, samt noen av utfordringen driftsteamet i DONG E P Norge opplever, er presentert. Videre er interne arbeidsprosesser for driftsteamet i DONG E P Norge kartlagt og analysert med fokus på hvilke fordeler som kan oppnås ved å visualisere arbeidsoppgaver gjennom kart.

Student name: Susanne Åge
Academic advisor: Liyanage, Jayantha
Partners: Dong E P Norge
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Title: **Identifying and evaluating high risk areas and challenges on marine drilling riser system in relation to deepwater problems**

Status:

Abstract:

The main concerns during drilling operations are riser integrity and maintaining well control. This thesis has mainly been focusing on the problems and challenges faced with the marine riser system to illuminate high risk areas related to riser integrity. A marine riser system consists generally of four main elements; the upper marine riser package, riser joints, lower marine riser package, and the blowout preventer, each playing an important part in the marine riser system. The marine riser function is to supports and guide the auxiliary lines used to control the well, and connect and provide for fluid communication between the drilling vessel and the wellhead. ailure to the marine riser is related to technical problems associated with old design and lack of correct operating procedure and maintenance method. Elements like the telescopic joint haven t change the design since the 1 60 s and are exposed to problems like unplanned discharge caused of premature war to the packer element. Problems with the telescopicjoint are not unique there are also experienced failure with tensioner system, flex joint and blowout preventer. Studies show that blowout preventer failure cases the longest downtime and most expensive repairs.

Student name: Iversen, Alexander
Academic advisor: Tore Markeset
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Title: **Offshorekraner**

Status:

Abstract

I forbindelse med at Ekofisk-området i Nordsjøen bygges ut er det planlagt og under bygging tre plattformer som skal installeres og settes i drift i perioden 2013 til 2014. To av disse nye plattformene skal knyttes opp mot Ekofisk feltet mens den tredje skal knyttes opp mot Eldfisk feltet. ConocoPhillips er operatør på begge disse feltene og er også de som står for utbyggingen. I forbindelse med utbyggingen er det bestemt at plattformene skal installeres med diesel-hydrauliske offshorekraner og hovedpoenget med denne oppgaven har vært å finne ut hvorfor valget falt på diesel-hydrauliske kraner fremfor andre krantyper. De andre krantypene som er vurdert i denne oppgaven er elektro-hydrauliske og helelektriske kraner. Historien om hvordan ConocoPhillips ble etablert som en olje og gass operatør på norsk sokkel er fortalt i kapittel 1. Her angis det også hvordan Ekofisk-området er bygget opp og hvilke plattformer området består av. Dette for å gi en oversikt over hvor stort Ekofiskområdet er og hvor mange kraner som operer på feltet.

Student name: Søndena, Marit C.
Academic advisor: Tore Markeset
Partners:
Contact information: Email: tore.markeset@uis.no

Title: **Development of FMEA/RCM methodology to be implemented in Generic Maintenance Concepts**

Status:

Abstract:

This master thesis has developed methods for how to interpret failure data and incorporate these into OIA's existing database. This also gave input to improvement of OIA's existing software Kamfer to develop more functionality to be able to document the work process of adding failure data to the existing Generic Maintenance Concepts. Further, this master thesis identified areas in the Oceanering Asset Integrity (OAI)'s existing methodology that can be improved to be in compliance with regulatory requirements for establishing a preventive maintenance program. The research was directed towards regulatory requirement for the Norwegian Continental Shelf, and any standards or writings with regards to FMEA/RCM processes and failure data. Pitfalls with regards to FMEA/RCM and failure data is that these areas of study are mainly for design of equipment and corporate risk assessments, so some interpretations has been done to be consistent both with regards to FMEA/RCM methodology and OIA's existing methodology. Formulas for calculating failure rates from the Oreda failure data has been developed as part of the study. Suggestions for optimizing a PM program based on historical data are also included.

Student name: Vestvik, David Halvorsen

Academic advisor: Tore Markeset

Partners:

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Title: **Investigation of condition based maintenance practice within Norwegian oil and gas**

Status:

Abstract: The Oil and Gas industry s increasing demands within risk management, cost efficiency, plant availability and the technology development have led to an increased interest for monitoring of equipment for performance and maintenance purposes. Today you have the possibility to monitor the condition and performance of almost every type of equipment. Characteristics of condition based maintenance are that many processes are involved, it includes many disciplines, it generates much information and it uses sophisticated computer and information technology. Increasing monitoring can therefore make maintenance operations and management more complex. Condition based maintenance has previously also suffered with implementation problems and conservatism towards it. Another challenge with monitoring is that it needs to be specified early in the project life cycle, limiting the time available for analysis. This thesis focuses on instrumented monitoring for maintenance purposes and condition based maintenance. The issues mentioned above and the many factors to account for, as opposed to other maintenance strategies, makes the task of determining and justifying appropriate condition monitoring for effective maintenance purposes, challenging. This thesis investigates, based on a survey targeting oil gas companies, what challenges the companies experience and what their needs are in relation to condition based maintenance and condition monitoring. The objective is to see if increasing use of monitoring increases operational value and if increasing monitoring should be perused. The thesis also investigates a methodology used in an engineering contractor company as an example of how they treated the challenges on selecting CBM solutions. Standards on condition monitoring and condition based maintenance has been reviewed too see if they provide any useful information in solve the challenges. The survey indicates that the companies encourage increased use of monitoring and that they are not experiencing any major challenges that will limit monitoring.

Student name: Heggland, Eirik

Academic advisor: Tore Markeset

Partners:

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Title: **Fatigue of service pipes**

Status:

Abstract:

The first part of this thesis will present the principle of fatigue, vibration and damping of service pipes on the Norwegian continental shelf. Thus us used for the creation of a screening methodology for prioritizing service pipes with regards to susceptibility to fatigue damage. The methodology provides the user with a toolset for identification and evaluation of the various service pipes in operation. An acceptance criterion of a damping ratio of 0.3 for service pipes has been identified. Pipes with a damping ratio lower than 0.3 has been shown to experience high amplitudes in the case of resonance freqiencies.

Student name: Augestad, Andre
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Partners:
Contact information: Email: tore.markeset@uis.no

Title: **Downhole cutting tool design concept for use
with the AWS "Driller"**

Status:

Abstract:

Production tubing cutting operations is getting more and more common in the North Sea; this is a product of an increasing number of Plug and Abandonment operations and re-completions of old wells. The most common method of cutting production tubing has for a long time been explosive cutters. These cutters are relatively simple in use, cheap to produce and quite reliable. However, explosive cutters are as the Title implies containing explosives. Explosive handling offshore should be kept to a minimum since the consequence of an explosion during handling of these types of cutters would most likely be fatal. Together with the other disadvantages of explosive cutters a nonexplosive cutter should always be considered for the job. The goal with this thesis was to design a non-explosive cutting tool that could be powered by an already existing Electro-Mechanical AWS tool.

Student name: Grønnerød, Anders
Academic advisor: Tore Markeset
Partners:
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Title: **Methodology for development of condition-based maintenance program for surface drilling equipment**

Status:

Abstract:

Maintenance is the essential part of production process in today's industry. There are several philosophies (e.g. corrective maintenance and preventive maintenance) and concepts (e.g. overall equipment efficiency and reliability-centered maintenance) that are applied in industry. The challenge here is to choose the proper ones for the specific operation conditions and equipment. The solution to this challenge can be found through implementation of a reliability-centered maintenance (RCM). This concept implies application of combination of different maintenance policies. The author determines a condition-based maintenance (CBM) as one of the most challengeable policy among them. The development of CBM program needs an application of several complex tools. It is sometimes difficult to use these tools in combination with each other. The main aim of the thesis is to set up a comprehensive methodology intended to develop the CBM program and ensure its continuous improvement.

Student name: Sizov, Ilya
Academic advisor: Tore Markeset
Partners:
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Title: **Analysis of component criticality in the blowout preventer**

Status:

Abstract:

During well drilling operation, there is a possibility of a kick (influx). When a kick is not controlled properly it will become a blow out. This is an uncontrolled and sudden flow of formation fluid that releases from a reservoir through a well bore into surface as a result of pressure difference in formation and well. The kick could flow to surface and create explosions causing fatality, environment damage and loss of asset resulting in high cost. There are procedures and methods to deal with the occurrence of kicks and blowouts in order to control a well flow. Moreover, well barriers should be established and designed based on the characteristics of the reservoir and rock formation. The last line of protection in well barriers is known as Blowout Preventer (BOP). It is one of the most important barriers to prevent unintentional hydrocarbon release when all well barriers in a well have failed. There are many factors that influence the performance of a BOP. The purpose of this thesis is to determine the criticality of components in BOP related to the redundancies they have during well shut in, stripping, snubbing and BOP testing operation. By knowing the criticality of BOP components, we can assure which components that should be focused on for maintenance and testing. It will also indicate which components that gives redundancy to the BOP during well shut in, stripping, snubbing and BOP testing operation, if one or more components are failed. A literature study is the main work of this thesis.

Student name: Januarilham, Yahya
Academic advisor: Terje Aven
Partners:
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Title: Optimization of periodic maintenance using condition monitoring techniques and operational data

Status:

Abstract:

This thesis contributes optimization of periodic maintenance using condition monitoring techniques and operational data so that maintenance can be performed before critical equipment fails. Periodic maintenance is carried out at regular intervals based on equipment's failure history. In this case, the maintenance interval is not scheduled in terms of the actual deteriorating condition of equipment. Therefore, either over-maintenance or undermaintenance could be performed. This will cause overstocking of spareparts, high maintenance cost and unnecessary downtime. By using Condition monitoring techniques such as vibration analysis, ultrasonic, oil analysis, infrared thermography, etc, the actual equipment condition can be monitored either continuously or periodically. By integrating the actual failure data acquired from condition monitoring techniques with historical (event) data, the current health condition and the remaining useful life of the equipment will be evaluated. Therefore, a suitable maintenance action can be scheduled and performed based on the current condition and projected remaining life of equipment. A procedure of condition monitoring is suggested in this thesis. Even though optimizing periodic maintenance using condition monitoring techniques leads to many benefits, there will be initial costs that may discourage the maintenance managers. This thesis presents a cost-benefit-analysis of condition based maintenance that helps the decision makers to decide the need of condition based maintenance to the given system. The last part of this thesis is to develop a methodology on how to select suitable equipment for condition based maintenance. Different criteria such as, criticality analysis, technical feasibility, economical analysis and others are considered for the selection process.

Student name: Dagnev, Abiot Tarekegn
Academic advisor: Markeset, Tore
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Title: **Protection of subsea pipelines against ice ridge gouging in conditions of substantial surface ice**

Status:

Abstract:

The development of Arctic offshore hydrocarbon fields involves transportation systems for oil and gas, which are represented either by tankers shipping or by pipeline systems. The latter have sustained behavior with respect to hydrocarbons delivery and relatively non-sophisticated operational requirements. However, some important challenges regarding Arctic conditions have to be carried out before the pipeline is constructed. Attention is given to the conditions of a specific hydrocarbon field of the Sakhalin offshore and a design of the 8 km offshore pipeline. Hydraulic assessment determines the size and number of pipelines as also temperature and pressure profiles, while mechanical estimations provide the wall thickness. As a result the main pipeline design aspects regarding dimensions and stresses occur are obtained, which is required for the next stage of the thesis. In the second part the issue of the pipeline interaction with first year ice ridges is described. A study of probable sizes of ice ridges, their peculiarities and morphology is performed in order to evaluate the design ridge geometry, physical properties and to understand how a ridge interacts with the soil.

Student name: Duplenskiy, Stanislav, V
Academic advisor: Ove Tobias Gudmestad
Partners:
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Title: Vessel Icing on the Shtokman FPSO

Status:

Abstract:

The purpose of this report is to investigate the phenomenon of vessel icing in general and examine the problem for the Shtokman PSO, which is now being designed to operate in severe conditions in the Barents Sea. Ice properties, icing conditions and intensity, geography of possible vessel icing are studied in details. Another aim is to develop theoretical models of the PSO icing considering its dimensions and design features. The goal is to analyze all known anti icing strategies, deicing and ice detection technologies for application and workability in the certain case of the Shtokman field. Finally possible affects of ice presence and icing on the PSO productivity and stability are studied. The results of the work might be taken into account in further vessel s design improvements and for efficient anti icing strategies. One of several major features of the PSO from icing point of view is sophisticated deck geometry with a number of deck structures of different height and width. Another issue is a presence of different equipment and engines that may act as sources of heat. This problem hasn t been studied yet due to its specificity. The work combines both theoretical research basing on the new proposed mathematical model and numerical calculations of icing on the PSO according to different international rules and standards. Results of this comparison are very promising and show potential for other work in this direction.

Student name: Efimov, Yaroslav E
Academic advisor: Ove Tobias Gudmestad
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Title: **Evacuation and rescue in the Barents Sea,
Critical issues for safe petroleum activity**

Status:

Abstract:

All year petroleum activity is not possible in the Barents Sea with regard to emergency preparedness unless sufficient attention is given to critical factors influencing evacuation and rescue. The objective of this thesis is to examine conditions relevant to evacuation and rescue of personnel from facilities operating in the Barents Sea. We are concerned with the boundary between situations that we can manage within emergency preparedness, procedures, technology and the situations where we may not be able to expect success. Certain situations may not be covered by emergency preparedness procedures due to conscious decisions that are made in the process of risk and emergency preparedness analysis, the selection of acceptance criteria and situations of hazard and accident. Limiting factors can be identified within the areas of human, technology, operational or organisational perspectives. Experts are normally aware of the limitations that are “designed into the system”. Limitations should be dealt with openly and honestly within a risk management regime. 3. Information about the limitations of the report The report considers the Norwegian sector of the Barents Sea north of the Norwegian mainland, south of Bjørnøya and extending eastwards towards the Norwegian/Russian border that came into effect in 2011.

Student name: Jacobsen, Sigurd J.
Academic advisor: Ove Tobias Gudmestad
Partners:
Contact information: Email: ove.t.gudmestad@uis.no

Title: **Installation of steel pipelines and flexible pipelines in
sideway current**

Status:

Abstract:

This master thesis is describing the theoretical analytical principles of pipeline installation. In the literature survey stage we elaborate on basic information about different types of offshore pipelines. Installation also plays an important and vital role. Therefore in the next step we introduce various installation methods for offshore pipelines and what may govern the choice of an installation method / scenario. Then guidelines and constrains for establishing the different installation methods are matters of our concerns. Calculations for two different cases related to documenting installation of steel pipelines and flexible pipelines in sideway current are included. The S-lay pipeline installation method will be taken for the analysis in the case study of this thesis.

Student name: Karimi, Mina
Academic advisor: Ove Tobias Gudmestad
Partners:
Contact information: Email: ove.t.gudmestad@uis.no

Title: **Subsesa in the ara Sea**

Status:

Abstract:

In this master s thesis the application of subsea technology in the Kara Sea were described. Using date for one perspective structure, several scenarios of field s development were observed; the most important recovery parameters have been evaluated. The analysis of transportation challenges was performed; also the probability estimation for the subsea installation in the Kara Sea was conducted.

Student name: Kornishin, Konstantin K

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Partners:

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Title: **Dynamic Analysis for the nstallation of Offshore Wind
Mill oundations**

Status:

Abstract:

This report looks into the possibility for using modified phased out shu le tankers to install jacket foundations for offshore wind turbines. New massive wind mill farms are now being planned out in water depths of 40 meters and beyond, making the transition from monopoles to jacket type foundations inevitable. The similarity between these new foundations and the much larger jackets used on oil platforms, makes it natural to look into if the already well established technology can be applied to these foundations as well. A thorough dynamic analysis is carried out by the use of the computer program MOSES. Included in the analysis is a time domain analysis which will be compared to third party analyses. Further investigations of the non-linear behaviour are made to test the possibility for normalizing into a frequency domain solution.

Student name: Madland, Stig
Academic advisor: Ove Tobias Gudmestad
Partners:
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Title: **PSO Concept for shallow waters in the Vietnam Offshore Oilfield-Block Hanoi Trough -**

Status:

Abstract:

Storage and offloading are integral parts of any oil and gas development project. This issue is more difficult and complex for offshore fields, because all or most parts of the equipment are located in the sea. For Block Hanoi Trough - 0 there is no exception. All equipment is planned to be installed in the sea. However, SO is the only floating unit in this oilfield. SO is the cheapest solution, due to absence of the onshore infrastructure. However, cheapest solution does not mean the simplest one. Shallow water and severe weather conditions create challenges for a vessel. An unwanted development of events might have a catastrophic consequence. The most input data regarding weather conditions and production rate are analyzed in the first part of the Thesis. Further general aspects of vessel such as types of hull, blocks of SO, types of mooring systems are discussed in second part of the Thesis. Last part is dedicated to engineering calculations. An SO model is built using computer aided engineering systems AstShip and Solidworks. Model has natural sizes, including the volume of tanks and realistic mass properties. To evaluate wind loads a superstructure was built.

Student name: Ozorishin, Alexy A
Academic advisor: Ove Tobias Gudmestad
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Title: **Alpha factors for the calculation of forecasted operational limits for marine operations in the Barents Sea**

Status:

Abstract:

The execution of marine operations often depends on the wave heights being low enough for safe operations. This needs to be the case for the time the operation takes. Weather forecasts are used to predict the wave heights. Uncertainties are connected to weather forecasts and higher wave heights than expected during a marine operation can potentially lead to accidents. Thus Det Norske Veritas introduced the so called “alpha factors” for the North and Norwegian Sea in its standard for Marine Operations (1 , 18). Alpha factors downgrade the operational wave height limit to a forecasted operational wave height limit to take care of the weather forecast uncertainty in these areas. This thesis explains the calculation as well as the use of the alpha factor. Comparisons to how other standards and guidelines treat the weather forecast uncertainty are drawn. Due to potentially more marine operations in the Barents Sea in the near future it is discussed how to take care of the weather forecast uncertainty in this region. Alpha factors for the Barents Sea are calculated. They indicate that the weather forecast uncertainty is bigger in the Barents Sea than further south.

Student name: Wilcken, Sara
Academic advisor: Ove Tobias Gudmestad
Partners:
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Title: **Trawl gear interaction with Subsea Pipeline**

Status:

Abstract:

This master thesis is written at the University of Stavanger in collaboration with IKM Ocean Design. The presence of both the fishing industry together with the oil and gas industry offshore results in development of methodologies and techniques on how to exercise offshore activities. It is known that problems can develop when trawl gear interacts with subsea structures like subsea pipelines, manifolds, wellheads, cables and others. Problems resulting from the interaction of trawl gear with subsea structures include safety of vessels, damage to subsea structures and fishing equipment as well as poor communication between the two industries. One of the most severe design cases for an offshore pipeline system is when there is interaction of fishing gear with a pipeline. Therefore it is important to further understand the behavior of the trawl equipment. Fishing gear weight and velocity as well as pipeline conditions like wall thickness, diameter, coating and flexural rigidity are basic parameters that need to be considered in order to understand the damage to the pipeline and fishing gear during the interference. Realistic description of load level and time history for interaction with a pipeline configuration on the sea bed including free span and pipeline stiffness shall be taken into account during the analysis of the interaction.

Student name: Yohannes, Berhane

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Title: **tending enterprise architecture models for cloud
computing**

Status:

Abstract:

The new wave of technology changes has introduced cloud computing. or an enterprise this innovation can bring great cost savings as well as risks. Therefore a special analysis process shall be done before the decision is made. This work focuses on Enterprise Architecture business process models as the main source of information about applications and data used by the company. We extend Business Process Modelling and Notation (BPMN) standard to include Cloud computing related information. In addition, we create software, which is able of processing BPMN models and defining whether element needs to be stored inside the company or placed in a private/public cloud. User can also define the preferred level of security. As an output the user is provided with modified BPMN model and a list of recommended service providers.

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Title: **Architectural issues in real-time business intelligence**

Status:

Abstract:

Business organizations are always in need of fast and intelligent decision support system. Today s Business environment is dynamic so data every minute are valuable. Real time Business intelligence (RTBI) is intelligence in business system which can make decision with minimum data latency from the time it is created to the time it is presented. The integration layer in Business Intelligence(BI) that extracts, transforms and loads(ETL) data in to data warehouse(DW) is the main component that adds data latency in BI. A new architecture to support RTBI along with the existing functionality is suggested in this thesis work. A prototype is made and implemented. Through the implemented prototype, tests are done to measure the performance of the architecture. A memory based processing component which is implemented in the architecture has be er performance on report generation for critical real time data.

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Title: Performance analysis and optimization of left outer join on map side

Status:

Abstract:

Ontologies are representations of the entities and relationships that structure an application area. Ontologies are important for tasks such as data integration, natural-language processing, information retrieval, and decision support. NCBO Resource Index is a system for ontology based annotation and indexing of biomedical data. With the increasing of its data, a distributed processing method should be implemented, which can store, compute and inquire those large-scale data in an efficient way. This paper is based on the master thesis of B. Byambajav, Methods for Large-scale Semantic Expansion on Hadoop Architecture, and going forward to seek a better solution for process NCBO Resource Index data and forced on performance optimization of left outer join on the Map side. In this paper, we researched and contrasted different kinds of join algorithms.

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Title: **Analytic methods for human activities at home**

Status:

Abstract:

This is an application which used an algorithm for detecting the behaviour in the home. The process is based on using the motion sensors and the duration of time. By receiving the data from different places, the application recognizes the mode of activity in the house. The process has ability to find the anomalous behaviour from the patient. The anomaly behaviour are categorized with the different levels of the emphasis.

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Title: **The container risk evaluation concept**

Status:

Abstract:

The international supply chain brings a wide range of threats: including the smuggling of illegal goods and substances, and the tampering with sea containers in order to hide nuclear, chemical or other weapons in them. Moreover with the introduction of House Resolution 1 (or “100% scanning law”) marine ports may face a problem of increased workload and unacceptable bottlenecks in their work flow as a result of scanning of every container. To improve the security of supply chains, there is a need to assess potential risks. The purpose of this study was to develop a concept for risk evaluation of sea containers bound for the USA and EU. The risk assessment should be efficient, cost effective and not cause big delays in work of marine ports. The investigation was conducted on how logistical data which is provided to customs authorities by all supply chain participants as well as different container inspection technologies (e.g. x-ray) can help to enhance the security of an international supply chain. The main research questions which were addressed in the project are: i) * which exact information is needed for container risk evaluation; * how this information can be evaluated; * how to integrate the risk evaluation process into the supply chain.

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Title: **Dynamic enterprise architecture - from static to dynamic models**

Status:

Abstract:

Nowadays the most commonly used technologies in Enterprise Architecture modeling are static. BPMN is one of such technologies, which is used widely for drawing models of business processes. Limitation of BPMN is that it gives a static image, or drawing, of business process without simulation capability. Petri net is one of the modeling tools with dynamics functionality. This functionality is mostly applied in simulation of discrete-event dynamic systems. Business process can be represented as such a system. BPMN and Petri net are completely different tools with different purposes. In the paper we suggest an original approach of transformation of BPMN to Petri net, in addition to it we propose an extension to BPMN diagram which will make further simulation with Petri net more powerful. As a proof for the suggested concept, we made a partial implementation of it.

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Title: **Modelling safety critical BOP closing times for arbitrary BOP control systems**

Status:

Abstract:

There are presently no recommended practises, defined by standards, for closing time calculation of Blow Out Preventers (BOPs), when designing BOP control systems. As the closing time is a safety critical design parameter for BOPs and BOP control systems, this paper proposes a model for calculating this value. A guideline is included in order to recreate an equivalent model, applicable for most BOP control system designs. Models are constructed and compared to an equivalent prototype system, comparing closing times and pressure trends throughout the closing function. The model assumes that the BOP control system has hydraulic pressure supplied from an accumulator bank, where the interfacing BOP is a blind/ blind shear ram. The models consider closing operations for both situations of drill pipe (DP) being either present or not in the bore. The modelling is done primarily using simple hydro mechanics and thermal mechanics in conjunction with API16D. All data sources, as far as practical, are published and peer-reviewed literature. Results from the model are promising for BOP closing times without DP in the bore. Inaccuracies were found when comparing to a BOP with DP present in bore. However the model does require some preliminary information about the BOP in order to give accurate predictions. In addition the model is not applicable for systems using rotating machinery as pressure source or where there are several independent pressure sources.

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Title: **Structural analysis to determine the stress induced loading on Wellhead Housing system supported by CAN and sea bed BOP supporter**

Status:

Abstract:

The present work investigates the effect of the bending loads on the wellhead systems and predicts the response of the conductor with the introduction of CAN™ (Conductor Anchor Node) and Seabed BOP Supporter. Performance of the wellhead and conductor system is dependent on field design parameters. These parameters can include local environmental loading, drilling rig motions, marine riser stack-ups and BOP (Blow-out Preventer) configuration and soil conditions. These loads may cause severe damage to the wellhead system. In order to reduce the effect of these loads, the possibility of incorporating other components such as the CAN™ and Seabed BOP Supporter can be considered. The present work aims at introducing the mentioned CAN™ and Seabed BOP Supporter in the wellhead system and assessing their influence on the bending moment response of the conductor.

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Title: **Low cost deep water wells**

Status:

Abstract:

A major cost-factor of drilling deep water wells today is associated with the high day rates of the larger rigs capable of drilling in such depths. Most subsea completions today are based on the 18-3/4" wellheads system. This wellhead size is normally required because of the number of casing strings needed to reach the down-hole target depth. Over the last two decades a number of different technologies have been developed to manage longer sections and to increase the drilling reach, especially in deep water. Some of these technologies are briefly described in this thesis, as well as a suggested alternative from the author. The Slim Wellhead Concept may be used to bring older 3rd or 4th generation rigs into the deep water market, achieving cost savings as well as possibilities to reach new water depths of exploration.

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